

Increasing the Abundance of Rare Native Wetland Prairie Species

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Summary

Native prairies of the Willamette Valley are considered among the rarest of Oregon's ecosystems and are in critical need of conservation. Management strategies for increasing the abundance of native species are urgently needed, particularly those strategies that promote the regeneration of native species from seed. Fire may be an important factor in promoting regeneration of native species from seed because of its historical role in maintaining the prairie landscape.

The study objectives were (1) to determine the effect of prescribed burning on regeneration of native species from seed, and (2) to establish predictive relationships between easily measured plant traits and seedling establishment rates in the field. The general approach was to sow seeds of target wetland prairie species during the fall into experimental field plots already established at the Danebo Wetland, Eugene, OR. Seedling establishment rates were then compared between burned and unburned plots the following spring. To establish predictive relationships these seedling establishment rates were related to selected seed and seedling traits measured under laboratory conditions.

Overall seedling establishment rates showed no significant differences between burned (7.0%) and unburned plots (8.7%), although for the seven species showing positive responses to prescribed burning, the increase was approximately doubled in the burned plots. Burning significantly increased the seedling establishment rates of three species, *Wyethia angustifolia*, *Grindelia integrifolia*, and *Danthonia californica*. Seedling establishment significantly decreased with burning for one species, *Sidalcea campestris*. For three of the four endangered, threatened or rare species, *Aster curtus*, *Horkelia congesta*, and *Sidalcea cusickii* var. *purpurea*, seedling establishment rates were smaller in the burned plots compared to the unburned plots, although the differences were not significant. *Lomatium bradshawii* had no seedlings establish in either the burned or the unburned plots.

Plant weight 7 days after germination was the best trait at predicting field seedling establishment rates for both the burned plots and the unburned plots, explaining a significant amount of variation in establishment rates: 70% for the burned plots and 45% for the unburned plots. This model could be used by managers to choose species for sowing in burned and unburned prairies or to estimate seeding rates at burned and unburned sites.